FIG. 1

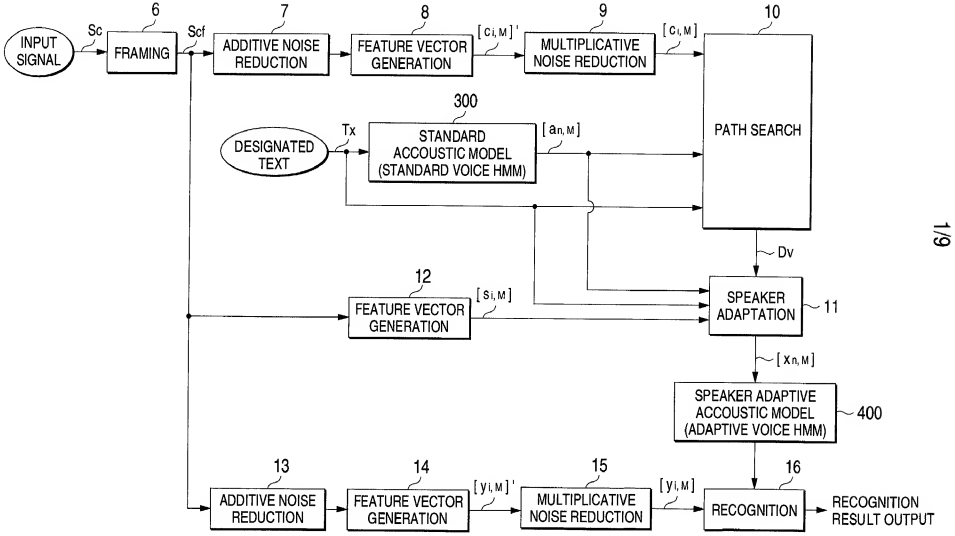

INPUT SIGNAL
Sc
6
FRAMING
Scf
7
ADDITIVE NOISE REDUCTION
8
FEATURE VECTOR GENERATION
[ci,M]'
9
MULTIPLICATIVE NOISE REDUCTION
[ci,M]
10
PATH SEARCH
300
DESIGNATED TEXT
Tx
STANDARD ACCOUSTIC MODEL (STANDARD VOICE HMM)
[an,M]
Dv
12
FEATURE VECTOR GENERATION
[si,M]
SPEAKER ADAPTATION
11
[xn,M]
SPEAKER ADAPTIVE ACCOUSTIC MODEL (ADAPTIVE VOICE HMM)
400
13
ADDITIVE NOISE REDUCTION
14
FEATURE VECTOR GENERATION
[yi,M]'
15
MULTIPLICATIVE NOISE REDUCTION
[yi,M]
16
RECOGNITION
RECOGNITION RESULT OUTPUT

FIG. 2

STATE NUMBER n	SYLLABLE	STANDARD VECTOR [$a_{n,M}$]				
1	A	[$a_{1,1}$	$a_{1,2}$	$a_{1,3}$	·····	$a_{1,M}$]
2	I	[$a_{2,1}$	$a_{2,2}$	$a_{2,3}$	·····	$a_{2,M}$]
3	U	[$a_{3,1}$	$a_{3,2}$	$a_{3,3}$	·····	$a_{3,M}$]
4	E	[$a_{4,1}$	$a_{4,2}$	$a_{4,3}$	·····	$a_{4,M}$]
5	O	[$a_{5,1}$	$a_{5,2}$	$a_{5,3}$	·····	$a_{5,M}$]
6	KA	[$a_{6,1}$	$a_{6,2}$	$a_{6,3}$	·····	$a_{6,M}$]
⋮	⋮			⋮		
10	KO	[$a_{10,1}$	$a_{10,2}$	$a_{10,3}$	·····	$a_{10,M}$]
11	SA	[$a_{11,1}$	$a_{11,2}$	$a_{11,3}$	·····	$a_{11,M}$]
⋮	⋮			⋮		
16	TA	[$a_{16,1}$	$a_{16,2}$	$a_{16,3}$	·····	$a_{16,M}$]
17	TI	[$a_{17,1}$	$a_{17,2}$	$a_{17,3}$	·····	$a_{17,M}$]
⋮	⋮			⋮		
21	NA	[$a_{21,1}$	$a_{21,2}$	$a_{21,3}$	·····	$a_{21,M}$]
22	NI	[$a_{22,1}$	$a_{22,2}$	$a_{22,3}$	·····	$a_{22,M}$]
⋮	⋮			⋮		
26	HA	[$a_{26,1}$	$a_{26,2}$	$a_{26,3}$	·····	$a_{26,M}$]
⋮	⋮			⋮		
31	MA	[$a_{31,1}$	$a_{31,2}$	$a_{31,3}$	·····	$a_{31,M}$]
⋮	⋮			⋮		
36	YA	[$a_{36,1}$	$a_{36,2}$	$a_{36,3}$	·····	$a_{36,M}$]
37	YU	[$a_{37,1}$	$a_{37,2}$	$a_{37,3}$	·····	$a_{37,M}$]
38	YO	[$a_{38,1}$	$a_{38,2}$	$a_{38,3}$	·····	$a_{38,M}$]
39	RA	[$a_{39,1}$	$a_{39,2}$	$a_{39,3}$	·····	$a_{39,M}$]
⋮	⋮			⋮		
44	WA	[$a_{44,1}$	$a_{44,2}$	$a_{44,3}$	·····	$a_{44,M}$]
45	WO	[$a_{45,1}$	$a_{45,2}$	$a_{45,3}$	·····	$a_{45,M}$]
46	N	[$a_{46,1}$	$a_{46,2}$	$a_{46,3}$	·····	$a_{46,M}$]
⋮	⋮			⋮		
N	⋮	[$a_{N,1}$	$a_{N,2}$	$a_{N,3}$	·····	$a_{N,M}$]

FIG. 3

TIME ↓

FRAME NUMBER i	AT THE TIME OF SPEAKER ADAPTATION, FEATURE VECTOR [$s_{i,M}$] GENERATED IN THE FEATURE VECTOR GENERATION SECTION 12				
1	[$S_{1,1}$	$S_{1,2}$	$S_{1,3}$	·····	$S_{1,M}$]
2	[$S_{2,1}$	$S_{2,2}$	$S_{2,3}$	·····	$S_{2,M}$]
3	[$S_{3,1}$	$S_{3,2}$	$S_{3,3}$	·····	$S_{3,M}$]
4	[$S_{4,1}$	$S_{4,2}$	$S_{4,3}$	·····	$S_{4,M}$]
5	[$S_{5,1}$	$S_{5,2}$	$S_{5,3}$	·····	$S_{5,M}$]
6	[$S_{6,1}$	$S_{6,2}$	$S_{6,3}$	·····	$S_{6,M}$]
7	[$S_{7,1}$	$S_{7,2}$	$S_{7,3}$	·····	$S_{7,M}$]
8	[$S_{8,1}$	$S_{8,2}$	$S_{8,3}$	·····	$S_{8,M}$]
9	[$S_{9,1}$	$S_{9,2}$	$S_{9,3}$	·····	$S_{9,M}$]
10	[$S_{10,1}$	$S_{10,2}$	$S_{10,3}$	·····	$S_{10,M}$]
11	[$S_{11,1}$	$S_{11,2}$	$S_{11,3}$	·····	$S_{11,M}$]
12	[$S_{12,1}$	$S_{12,2}$	$S_{12,3}$	·····	$S_{12,M}$]
13	[$S_{13,1}$	$S_{13,2}$	$S_{13,3}$	·····	$S_{13,M}$]
14	[$S_{14,1}$	$S_{14,2}$	$S_{14,3}$	·····	$S_{14,M}$]
15	[$S_{15,1}$	$S_{15,2}$	$S_{15,3}$	·····	$S_{15,M}$]
16	[$S_{16,1}$	$S_{16,2}$	$S_{16,3}$	·····	$S_{16,M}$]
17	[$S_{17,1}$	$S_{17,2}$	$S_{17,3}$	·····	$S_{17,M}$]
18	[$S_{18,1}$	$S_{18,2}$	$S_{18,3}$	·····	$S_{18,M}$]
19	[$S_{19,1}$	$S_{19,2}$	$S_{19,3}$	·····	$S_{19,M}$]
20	[$S_{20,1}$	$S_{20,2}$	$S_{20,3}$	·····	$S_{20,M}$]
⋮			⋮		
29	[$S_{29,1}$	$S_{29,2}$	$S_{29,3}$	·····	$S_{29,M}$]
30	[$S_{30,1}$	$S_{30,2}$	$S_{30,3}$	·····	$S_{30,M}$]

FIG. 4

TIME ↓

FRAME NUMBER i	AT THE TIME OF SPEAKER ADAPTATION, FEATURE VECTOR [$c_{i,M}$] OUTPUTTED FROM MULTIPLICATIVE NOISE REMOVAL SECTION 9				
1	[$C_{1,1}$	$C_{1,2}$	$C_{1,3}$	·····	$C_{1,M}$]
2	[$C_{2,1}$	$C_{2,2}$	$C_{2,3}$	·····	$C_{2,M}$]
3	[$C_{3,1}$	$C_{3,2}$	$C_{3,3}$	·····	$C_{3,M}$]
4	[$C_{4,1}$	$C_{4,2}$	$C_{4,3}$	·····	$C_{4,M}$]
5	[$C_{5,1}$	$C_{5,2}$	$C_{5,3}$	·····	$C_{5,M}$]
6	[$C_{6,1}$	$C_{6,2}$	$C_{6,3}$	·····	$C_{6,M}$]
7	[$C_{7,1}$	$C_{7,2}$	$C_{7,3}$	·····	$C_{7,M}$]
8	[$C_{8,1}$	$C_{8,2}$	$C_{8,3}$	·····	$C_{8,M}$]
9	[$C_{9,1}$	$C_{9,2}$	$C_{9,3}$	·····	$C_{9,M}$]
10	[$C_{10,1}$	$C_{10,2}$	$C_{10,3}$	·····	$C_{10,M}$]
11	[$C_{11,1}$	$C_{11,2}$	$C_{11,3}$	·····	$C_{11,M}$]
12	[$C_{12,1}$	$C_{12,2}$	$C_{12,3}$	·····	$C_{12,M}$]
13	[$C_{13,1}$	$C_{13,2}$	$C_{13,3}$	·····	$C_{13,M}$]
14	[$C_{14,1}$	$C_{14,2}$	$C_{14,3}$	·····	$C_{14,M}$]
15	[$C_{15,1}$	$C_{15,2}$	$C_{15,3}$	·····	$C_{15,M}$]
16	[$C_{16,1}$	$C_{16,2}$	$C_{16,3}$	·····	$C_{16,M}$]
17	[$C_{17,1}$	$C_{17,2}$	$C_{17,3}$	·····	$C_{17,M}$]
18	[$C_{18,1}$	$C_{18,2}$	$C_{18,3}$	·····	$C_{18,M}$]
19	[$C_{19,1}$	$C_{19,2}$	$C_{19,3}$	·····	$C_{19,M}$]
20	[$C_{20,1}$	$C_{20,2}$	$C_{20,3}$	·····	$C_{20,M}$]
⋮			⋮		
29	[$C_{29,1}$	$C_{29,2}$	$C_{29,3}$	·····	$C_{29,M}$]
30	[$C_{30,1}$	$C_{30,2}$	$C_{30,3}$	·····	$C_{30,M}$]

FIG. 5

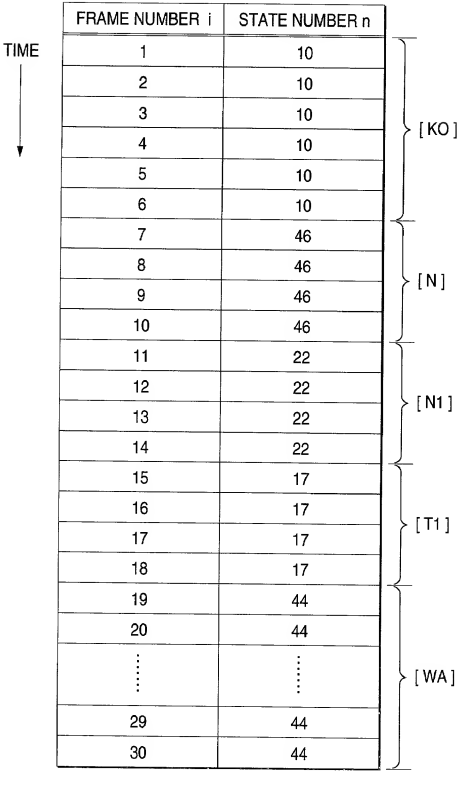

TIME
FRAME NUMBER i
STATE NUMBER n
1 10
2 10
3 10
4 10
5 10
6 10
7 46
8 46
9 46
10 46
11 22
12 22
13 22
14 22
15 17
16 17
17 17
18 17
19 44
20 44
29 44
30 44
[KO]
[N]
[N1]
[T1]
[WA]

FIG. 6

FRAME NUMBER i	FEATURE VECTOR [$s_{i,M}$]	STATE NUMBER n	STANDARD VECTOR [$a_{n,M}$]	
1	[$s_{1,1}$ ····· $s_{1,M}$]	10	[$a_{10,1}$ ····· $a_{10,M}$]	[KO]
2	[$s_{2,1}$ ····· $s_{2,M}$]	10	[$a_{10,1}$ ····· $a_{10,M}$]	
3	[$s_{3,1}$ ····· $s_{3,M}$]	10	[$a_{10,1}$ ····· $a_{10,M}$]	
4	[$s_{4,1}$ ····· $s_{4,M}$]	10	[$a_{10,1}$ ····· $a_{10,M}$]	
5	[$s_{5,1}$ ····· $s_{5,M}$]	10	[$a_{10,1}$ ····· $a_{10,M}$]	
6	[$s_{6,1}$ ····· $s_{6,M}$]	10	[$a_{10,1}$ ····· $a_{10,M}$]	
7	[$s_{7,1}$ ····· $s_{7,M}$]	46	[$a_{46,1}$ ····· $a_{46,M}$]	[N]
8	[$s_{8,1}$ ····· $s_{8,M}$]	46	[$a_{46,1}$ ····· $a_{46,M}$]	
9	[$s_{9,1}$ ····· $s_{9,M}$]	46	[$a_{46,1}$ ····· $a_{46,M}$]	
10	[$s_{10,1}$ ····· $s_{10,M}$]	46	[$a_{46,1}$ ····· $a_{46,M}$]	
11	[$s_{11,1}$ ····· $s_{11,M}$]	22	[$a_{22,1}$ ····· $a_{22,M}$]	[NI]
12	[$s_{12,1}$ ····· $s_{12,M}$]	22	[$a_{22,1}$ ····· $a_{22,M}$]	
13	[$s_{13,1}$ ····· $s_{13,M}$]	22	[$a_{22,1}$ ····· $a_{22,M}$]	
14	[$s_{14,1}$ ····· $s_{14,M}$]	22	[$a_{22,1}$ ····· $a_{22,M}$]	
15	[$s_{15,1}$ ····· $s_{15,M}$]	17	[$a_{17,1}$ ····· $a_{17,M}$]	[TI]
16	[$s_{16,1}$ ····· $s_{16,M}$]	17	[$a_{17,1}$ ····· $a_{17,M}$]	
17	[$s_{17,1}$ ····· $s_{17,M}$]	17	[$a_{17,1}$ ····· $a_{17,M}$]	
18	[$s_{18,1}$ ····· $s_{18,M}$]	17	[$a_{17,1}$ ····· $a_{17,M}$]	
19	[$s_{19,1}$ ····· $s_{19,M}$]	44	[$a_{44,1}$ ····· $a_{44,M}$]	[WA]
20	[$s_{20,1}$ ····· $s_{20,M}$]	44	[$a_{44,1}$ ····· $a_{44,M}$]	
⋮	⋮	⋮	⋮	
29	[$s_{29,1}$ ····· $s_{29,M}$]	44	[$a_{44,1}$ ····· $a_{44,M}$]	
30	[$s_{30,1}$ ····· $s_{30,M}$]	44	[$a_{44,1}$ ····· $a_{44,M}$]	

FIG. 7

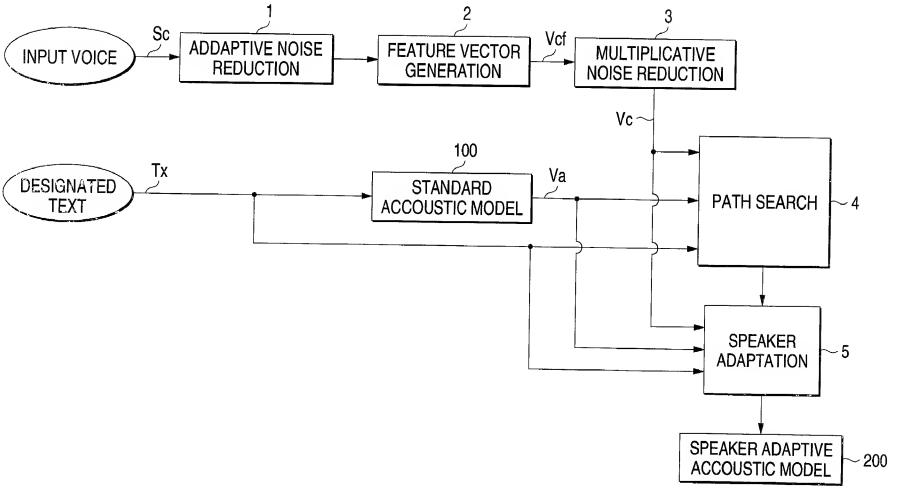
	AVERAGE FEATURE VECTOR [$s_{n,M}$]	STATE NUMBER n	STANDARD VECTOR [$a_{n,M}$]	
AVERAGE OF i = 1 ~ 6	[$s_{10,1}$ ····· $s_{10,M}$]	10	[$a_{10,1}$ ····· $a_{10,M}$]	← [KO]
AVERAGE OF i = 7 ~ 10	[$s_{46,1}$ ····· $s_{46,M}$]	46	[$a_{46,1}$ ····· $a_{46,M}$]	← [N]
AVERAGE OF i = 11 ~ 14	[$s_{22,1}$ ····· $s_{22,M}$]	22	[$a_{22,1}$ ····· $a_{22,M}$]	← [NI]
AVERAGE OF i = 15 ~ 18	[$s_{17,1}$ ····· $s_{17,M}$]	17	[$a_{17,1}$ ····· $a_{17,M}$]	← [TI]
AVERAGE OF i = 19 ~ 30	[$s_{44,1}$ ····· $s_{44,M}$]	44	[$a_{44,1}$ ····· $a_{44,M}$]	← [WA]

FIG. 8

STATE NUMBER n	SYLLABLE	ADAPTIVR VECTOR OF ACCOUSTIC HMM AFTER UPDATED
1	A	[$X_{1,1}$ $X_{1,2}$ $X_{1,3}$ ····· $X_{1,M}$]
2	I	[$X_{2,1}$ $X_{2,2}$ $X_{2,3}$ ····· $X_{2,M}$]
3	U	[$X_{3,1}$ $X_{3,2}$ $X_{3,3}$ ····· $X_{3,M}$]
4	E	[$X_{4,1}$ $X_{4,2}$ $X_{4,3}$ ····· $X_{4,M}$]
5	O	[$X_{5,1}$ $X_{5,2}$ $X_{5,3}$ ····· $X_{5,M}$]
6	KA	[$X_{6,1}$ $X_{6,2}$ $X_{6,3}$ ····· $X_{6,M}$]
⋮	⋮	⋮
10	KO	[$X_{10,1}$ $X_{10,2}$ $X_{10,3}$ ····· $X_{10,M}$]
11	SA	[$X_{11,1}$ $X_{11,2}$ $X_{11,3}$ ····· $X_{11,M}$]
⋮	⋮	⋮
16	TA	[$X_{16,1}$ $X_{16,2}$ $X_{16,3}$ ····· $X_{16,M}$]
17	TI	[$X_{17,1}$ $X_{17,2}$ $X_{17,3}$ ····· $X_{17,M}$]
⋮	⋮	⋮
21	NA	[$X_{21,1}$ $X_{21,2}$ $X_{21,3}$ ····· $X_{21,M}$]
22	NI	[$X_{22,1}$ $X_{22,2}$ $X_{22,3}$ ····· $X_{22,M}$]
⋮	⋮	⋮
26	HA	[$X_{26,1}$ $X_{26,2}$ $X_{26,3}$ ····· $X_{26,M}$]
⋮	⋮	⋮
31	MA	[$X_{31,1}$ $X_{31,2}$ $X_{31,3}$ ····· $X_{31,M}$]
⋮	⋮	⋮
36	YA	[$X_{36,1}$ $X_{36,2}$ $X_{36,3}$ ····· $X_{36,M}$]
37	YU	[$X_{37,1}$ $X_{37,2}$ $X_{37,3}$ ····· $X_{37,M}$]
38	YO	[$X_{38,1}$ $X_{38,2}$ $X_{38,3}$ ····· $X_{38,M}$]
39	RA	[$X_{39,1}$ $X_{39,2}$ $X_{39,3}$ ····· $X_{39,M}$]
⋮	⋮	⋮
44	WA	[$X_{44,1}$ $X_{44,2}$ $X_{44,3}$ ····· $X_{44,M}$]
45	WO	[$X_{45,1}$ $X_{45,2}$ $X_{45,3}$ ····· $X_{45,M}$]
46	N	[$X_{46,1}$ $X_{46,2}$ $X_{46,3}$ ····· $X_{46,M}$]
⋮	⋮	⋮
N	⋮	[$X_{N,1}$ $X_{N,2}$ $X_{N,3}$ ····· $X_{N,M}$]

machine translation

FIG. 9


INPUT VOICE
Sc
1
ADDAPTIVE NOISE REDUCTION
2
FEATURE VECTOR GENERATION
Vcf
3
MULTIPLICATIVE NOISE REDUCTION
Vc
DESIGNATED TEXT
Tx
100
STANDARD ACCOUSTIC MODEL
Va
PATH SEARCH
4
SPEAKER ADAPTATION
5
SPEAKER ADAPTIVE ACCOUSTIC MODEL
200